REMARKS

The examiner is thanked for the performance of a thorough search. By this amendment, Claims X, X, X and X have been amended. Claims 15-17 are canceled. Claims 18-35 are new. Hence, Claims 1-14 and 18-35 are pending in the application. The amendments to the claims as indicated herein do not add any new matter to this application. Furthermore, amendments made to the claims as indicated herein have been made to exclusively improve readability and clarity of the claims and not for the purpose of overcoming alleged prior art. Each issue raised in the Office Action mailed February 15, 2006 is addressed hereinafter.

I.   ISSUES RELATING TO PRIOR ART

A.   CLAIMS 1-5—MEYER I

Claims 1-5 stand rejected under 35 U.S.C. §102(b) as allegedly anticipated by Meyer et al. US Publication 2002/0145976 ("Meyer I"). The rejection is respectfully traversed.

A rejection under §102 is traversed if the claims recite one or more features, elements, steps or limitations that are not found in the cited reference. Stated another way, the cited reference must teach or disclose each and every feature of the claims, arranged as in the claims. *See Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548, 220 USPQ 193, 198 (Fed. Cir. 1983). The claims of the present application contain features not found in the reference, and therefore the rejection is overcome.

The Office action contends that Meyer I shows the subject matter of claims 1-5 at paragraphs 0040-0060. This is incorrect for at least two reasons:

1.   **Meyer Does Not Provide Responsive Action Only When the TCP Re-transmission Buffer is Empty.** Original claim 1 provided for incrementing a false duplicate ACK counter when the TCP re-transmission buffer maintained by the receiver is empty. Present claim 1 clarifies that the responsive action of claim 1—sending a corrective ACK message—also occurs only when the TCP re-transmission buffer is empty. In contrast, Meyer I does not provide

a counter of **false** duplicate ACKs—Meyer I counts *all* duplicate ACKs—and Meyer I responds whenever a duplicate-ACK count is reached, regardless of the state of the re-transmission buffer. Meyer I does not test whether the re-transmission buffer is empty.

Indeed, Meyer I **teaches away** from the claimed invention by describing **retransmitting the oldest unacknowledged segment** when the ACK count threshold is exceeded. (See FIG. 1, step S5 and [0045].) A re-transmitted segment necessarily comes from the re-transmission buffer. Meyer I could not perform such a retransmission if the buffer was empty, and Meyer I provides no hint about what to do in that situation. Meyer I does not even describe the same problem as Applicants—namely, how to prevent attacks on TCP systems arising from the intentional or malicious transmission or injection of false duplicate ACK segments.

Because Meyer I does not test whether the re-transmission buffer is empty, and does not perform an action only when the buffer is empty, Meyer I does not anticipate claim 1.

2.   **Meyer Does Not Send a Corrective ACK Message.** Original claim 1 recites "sending a corrective ACK message that provides a correct sequence value and ACK value" in response to determining that a false duplicate ACK count is exceeded. In contrast, Meyer I provides only for re-transmitting a segment from the re-transmission buffer. A TCP data segment is not an ACK segment. A re-transmitted segment as in Meyer I is not a corrective ACK message as claimed, and the Office Action does not cite a particular paragraph of Meyer I that allegedly provides a corrective ACK segment. Sending re-transmissions as in Meyer I will not solve the problem that Applicants address in the specification and solve in claim 1.

For at least the foregoing reasons, claim 1 has at least one feature not found in Meyer I. Therefore, an anticipation rejection of claim 1 is not supported in Meyer I. Claims 2-5 depend from claim 1 and include the features described above by dependency. Therefore, Meyer I does

not anticipate claims 2-5 for the same reasons set forth above for claim 1. Reconsideration is respectfully requested.

B.   CLAIMS 6-17—MEYER I AND MEYER II

Claims 6-17 stand rejected under 35 U.S.C. §103 as allegedly unpatentable over Meyer I in view of Meyer et al. US Publication 2003/0191844 ("Meyer II"). The rejection is respectfully traversed.

A rejection under §103 must provide the complete claimed subject matter from one or more prior art references. Claims 6 and 7 depend from claim 1. Claims 15-17 are canceled, but new claims 18-20 recite similar subject matter and all features described above for claim 1. Claim 1 includes at least two features not found in Meyer I as stated above, and Meyer II does not cure the deficiencies of Meyer I that are described above. Further, the Office Action does not rely on Meyer II to "fill gaps" of Meyer I relating to claim 1. Therefore, any combination of Meyer I with Meyer II cannot provide the complete subject matter recited in claim 1 or any dependent claim. Accordingly, claims 6, 7, and 18-20 are allowable over Meyer I and Meyer II.

Regarding claims 6-7, the Office Action contends that Meyer I provides "receiving the corrective ACK message" as "a segment is retransmitted ..." This is incorrect. Re-transmitting a data segment from the re-transmission buffer is not the same as sending a corrective ACK message as claimed. The Office Actions' motivation to combine is also misplaced. The Office Action contends that a skilled artisan "would have been motivated by the suggestion of Meyer II to avoid unnecessary retransmissions and reduce the burstiness of the transmissions" (citing Meyer II [0011]). However, Applicants' disclosure is concerned with attack prevention, not avoiding retransmissions or addressing bursts. Therefore, a skilled artisan seeking to solve the same problem as Applicants would not, based on the cited part of Meyer II, think to combine Meyer II with Meyer I.

Claims 8-14 recite special processing that is performed in response to segments that have sequence numbers too far outside an expected range. In particular, claims 8-14 recite that "if the sequence value gap is too large, then performing the steps of: creating and sending a dummy segment carrying a particular sequence value that is just prior to a last properly acknowledged sequence value; receiving an acknowledgment of the dummy segment; determining whether a second sequence value carried in the acknowledgment is less than a third sequence value of the first TCP segment; and discarding the particular TCP segment from the re-assembly buffer when the second sequence value carried in the acknowledgment is less than the third sequence value of the particular TCP segment." (The preceding claim subject matter is termed **the dummy segment features** hereinafter.)

Regarding claims 8-17, the Office Action contends that the dummy segment features are found in Meyer II at paragraphs [0039] to [0060]. This is incorrect. Meyer II describes **discarding** packets that have a sequence number that is out of range at [0039], last sentence. At [0063], Meyer II also describes **retaining** retransmitted packets even when a large sequence gap is detected and simply requesting the sender to send missing intervening retransmissions. In the claimed approach, a received segment with a sequence number reflecting a large gap is temporarily held in the buffer, but removed if a dummy segment is sent and another gap is detected, indicating spurious transmissions. Those claim features are completely absent from the logic of FIG. 4 of Meyer II and all related description.

Meyer II describes sending **status messages triggered by erroneous retransmissions** ([0044]), but does not teach the particular dummy segment that is claimed or the subsequent tests of a second and third sequence value as claimed. However, the status messages of Meyer II are not triggered by out-of-range sequence numbers. Sending status messages in Meyer II is an

attempt to deal with erroneous retransmissions that fail to fill a previously detected sequence number gap, not a response to a sequence value gap that is too large.

Thus, with respect to large sequence value gaps, Meyer II merely describes dropping an offending segment ([0022]) or permanently retaining a segment (FIG. 4, [0063]). Meyer II does not send a dummy segment in an attempt to determine if proper data or spurious data was sent. On the one hand, Meyer II does nothing to address the fact that sequence gaps may occur when packets of a trusted sender have been dropped, so that a segment with a sequence number gap actually may be valid. Instead, Meyer II simply drops all packets with gaps. On the other hand, Meyer II also does nothing to address the fact that packet received at FIG. 4, step 3b ([0063]) could be spurious data from an attacker—Meyer II accepts such segments and simply requests allegedly missing retransmissions from the sender.

In contrast, claim 8 provides for a far more intelligent approach in which a segment reflecting a gap is discarded only after sending a dummy segment and determining, from a response to the dummy segment, that the prior segment was spurious. For at least these reasons, Meyer II does not describe or suggest the subject matter of claim 8.

Claims 9-14 depend from claim 8 and recite all the features of claim 8 that are described above. Therefore, the references do not teach or suggest the subject matter of claims 9-14 for the same reasons given above. Reconsideration is respectfully requested.

C.   NEW CLAIMS 18-35

New claims 18-35 generally have the same scope as claims 1-14, but are presented in different claim formats. Claims 18-20 correspond to claim 1 but are presented in apparatus format and computer-readable-medium format. Claims 28-29 correspond to claim 8 but are presented in apparatus format. Claims 21-27 and 30-35 correspond to the dependent claims

described above. Thus, new claims 18-35 are allowable for the same reasons given above for

claims 1-14. Favorable consideration is respectfully requested.

II.   CONCLUSIONS & MISCELLANEOUS

For the reasons set forth above, all of the pending claims are now in condition for

allowance. The Examiner is respectfully requested to contact the undersigned by telephone

relating to any issue that would advance examination of the present application.

A petition for extension of time, to the extent necessary to make this reply timely filed, is

hereby made. If applicable, a law firm check for the petition for extension of time fee is enclosed

herewith. If any applicable fee is missing or insufficient, throughout the pendency of this

application, the Commissioner is hereby authorized to any applicable fees and to credit any

overpayments to our Deposit Account No. 50-1302.

Respectfully submitted,

HICKMAN PALERMO TRUONG & BECKER LLP

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Christopher J. Palermo
Reg. No. 42,056

2055 Gateway Place Suite 550
San Jose, California 95110-1093
Telephone No.: (408) 414-1080x202
Facsimile No.: (408) 414-1076